

**Australian Marine Mammal Centre**  
**Final Report**  
**(subclause 9 and Schedule Item 5 of the Funding Agreement)**

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- **Project No.** – 2010/08
- **Title** - Developing a decision process based on expert knowledge to inform the management of dugongs and coastal dolphins in Northern Australia: the Yanyuwa sea country in the Northern Territory as a case study: Phase 2
- **Chief Investigator** – Professor Helene Marsh
- **Organisation** – James Cook University
- **Activity Period** – 01 January 2011 – 31 January 2012

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**1. Activity Summary**

A clear summary of approximately 500 words outlining the work undertaken and any significant findings (for publication on the Department's web site)

1. Indigenous communities are the dominate providers of environmental management in the remote regions of northern Australia. These remote regions support globally significant populations of tropical marine wildlife of conservation concern including dugongs, coastal dolphins, whales and marine turtles in, or adjacent to, 'Sea Country' over which Indigenous communities have significant legal rights. Thus it is both legally necessary and cost-effective for a national approach to management of marine wildlife in northern Australia, and for management and research agencies to work in partnership with Indigenous communities and sea ranger groups.
2. We developed a process incorporating Indigenous Knowledge and western science to inform the management of coastal marine mammals in northern Australia, particularly the coastal dolphins and dugongs, using the Sea Country of the Yanyuwa people in the Northern Territory as a case study.
3. We conducted a series of community mapping and knowledge sharing workshops to record the Indigenous Knowledge of Traditional Owners and other stakeholders. This shared knowledge was used to inform the design of dedicated vessel surveys conducted in partnership between our research team

and the li-Anthawirriyarra Sea Rangers in accordance with a formal negotiated research agreement.

4. The collated digitised information on the distribution of coastal dolphins from workshop participants and the long-term field notes of Bradley suggested that three species of coastal dolphins used much of the habitat around the Sir Edward Pellew Islands. The snubfin dolphin sightings were widely distributed, especially in inshore waters with occasional sightings in rivers. The reported sightings of humpback and bottlenose dolphins were also widely distributed but tended to be more offshore. Most reports of dugongs were inshore and around river mouths and mudflats.
5. There was good agreement between this Indigenous Knowledge and: (1) the high density dugong areas previously identified using systematic aerial surveys conducted by scientists; and (2) the dedicated vessel surveys conducted in November 2009 and May and November 2011, by the research team in partnership with the li-Anthawirriyarra Sea Rangers. These surveys confirmed that the three species of coastal dolphins occur in low numbers and that dugongs are much more common than the dolphins.
6. The outputs of the workshops and vessel surveys provide the range of knowledge required for the Yanyuwa community to develop wildlife management strategies within their Sea Country to inform policies such as the National Network of Marine Protected Areas, the proposed National Network of Whale and Dolphin Sanctuaries and status evaluations of species of conservation concern.
7. This process has the potential to have broad application in the remote coastal waters of Northern Australia in the design of Protected Areas and in species status assessments.

## **2. The Outcomes/Objectives**

### **List of the Project Objectives**

To contribute to the development and evaluation of a decision process based on the expert knowledge of Traditional Owners and fishers to inform arrangements to manage dugongs and coastal dolphins across northern Australia using the Sea Country of the Yanyuwa people in the Northern Territory by:

1. conducting a follow-up survey for marine mammals using the same survey design and protocols as in the survey conducted in November 2009 to determine the robustness of the results of the original survey,
2. using results of the survey to update the Decision Support System developed in Phase 1 of this project
3. advising stakeholders of the results of the project according to agreed protocols

4. working with the Yanyuwa sea rangers to develop scientifically-robust protocols for long-term monitoring of marine mammals by Indigenous Australians.

**The degree to which the Activity has achieved each of the objectives**

**Objective 1**

Follow up surveys for marine mammals were conducted in May 2011 to investigate potential temporal differences in marine mammal distribution and abundance, as well as a repeat of surveys in November 2011 to determine the robustness of the results of the original survey. The results confirmed that although the habitat is apparently ideal for inshore dolphins, numbers are worryingly small. This activity exceeded its original objective, as two surveys were undertaken rather than the one survey that was originally planned.

**Objective 2**

The results of the survey have been used to update the decision process, as evidenced in the attached draft manuscript to be submitted to 'Ecology and Society'.

**Objective 3**

Stakeholders have been informed of the project results through reports after each survey. A final report suitable for the li-Anthawirriyarra Sea Rangers and Yanyuwa families is being produced based on a combination of all survey results. The final results of this project will be presented to li-Anthawirriyarra Sea Rangers and Yanyuwa families in a future workshop to be undertaken as part of Dr. Isabel Beasley's Bill Dawbin postdoctoral fellowship at JCU.

**Objective 4**

Scientifically-robust protocols have been established and trialled for long-term monitoring of marine mammals by Indigenous Sea Ranger groups. Although successful effective as a collaboration between Sea Rangers and Scientists, additional protocols need to be developed to enable successful collection of standardised data by Sea Rangers only. This project has provided Dr. Isabel Beasley the opportunity to participate in project activities, where she will now continue this work on Yanyuwa Sea Country as part of her Bill Dawbin postdoctoral fellowship at JCU.

**3. Appropriateness**

**The appropriateness of the approaches used in the development and implementation of the Activity**

Project approaches were appropriate for working with Yanyuwa Traditional Owners as a result of the Research Partnership Agreement that was developed prior to project activities.

A multi-disciplinary research team was assembled which consisted of the li-Anthawirriyarra Sea Rangers of Borrooloola and research scientists and government

officers with expertise in: cross-cultural literacy and the Yanyuwa community; marine mammal surveys in remote areas; geographical information systems; and marine planning and management. The support of the Yanyuwa community, including written in-principle agreement, was negotiated between the research team and the li-Anthawirriyarra Sea Rangers.

The roles and responsibilities of each of the partner organisations (including the research institutions, the effective as a collaboration between Sea Rangers and Scientists , with more effort being required to develop scientifically robust protocols for long-term independent) were detailed in a Research Partnership Agreement. The Agreement was negotiated to ensure a clear understanding regarding survey and data gathering protocols, data access arrangements, data storage and use of the data by each group, and the key products from the study (e.g. training manuals, databases, community posters etc.). The Agreement was designed to protect Yanyuwa Intellectual Property, ensure appropriate regional and national data standardisation and establish protocols for the vessel surveys, data sharing and management. The Agreement also outlined which data were to be retained within the Yanyuwa community and/or shared with external agencies, including government agencies and other Indigenous communities and under what conditions.

Methods used to conduct vessel surveys to assess the status of marine mammals were appropriate, as we used the spatial information on wildlife distribution identified at the mapping and knowledge sharing workshops, along with our own relevant expert knowledge of small boat surveys, to design a standard shipboard line transect survey (Buckland et al. 2001), covering the coastal and offshore waters of the Sir Edward Pellew Island Group area of the Yanyuwa Sea Country. Transect lines were placed perpendicular to the island shorelines and spaced approximately four kilometres apart. We aimed to survey each transect line once during every survey period, depending on suitable weather conditions (i.e. Beaufort 4 or less, and swells to less than 1.5 metres). Photo-identification studies were also trialled throughout the study based on established methodologies.

#### **4. Effectiveness**

**The degree to which the Activity has effectively met its stated objectives**

All activities undertaken in this project have successfully met their stated objectives, and have been highly effective.

The objective of ‘*working with the Yanyuwa Sea Rangers to develop scientifically-robust protocols for long-term monitoring of marine mammals by Indigenous Australians*’, was effective as a collaboration between Sea Rangers and Scientists , with more effort being required to develop scientifically robust protocols for long-term independent monitoring by Sea Ranger Units. It is critical that this objective is effective, as information required to develop plans to conserve populations of coastal dolphins and dugong across their Australian ranges is logistically difficult and expensive to obtain using western science techniques. A standardised long-term monitoring protocol adopted by Indigenous Sea Ranger groups throughout northern Australia would contribute significantly to further understanding coastal dolphin

habitat use in remote areas of northern Australia.

If replicated widely, such a monitoring program will be suitable for producing broad-scale distribution and relative abundance information but is unlikely to be suitable for trend information except over very long time-frames even at locations where the dolphins are more abundant than in Yanyuwa Sea Country. Such information will likely require a mark-recapture study based on photo-identified dolphins, perhaps in association with a sampling regime that is less logistically demanding than the transect survey used here, such as point sampling as used for manatees in Belize.

Dr. Isabel Beasley will continue this work on Yanyuwa Sea Country and other regions of northern Australia where dolphins may be more abundant as part of her Bill Dawbin postdoctoral fellowship at JCU, with a primary aim of further developing a robust protocol for long-term monitoring of marine mammal populations for use by Indigenous Sea Ranger groups.

## 5. Communication

### How results will be communicated to management

A draft manuscript has been prepared entitled – ‘A process incorporating Indigenous Knowledge and Western Science to inform the management of marine wildlife in northern Australia’, which will be submitted to ‘Ecology and Society’.

A further draft manuscript will be prepared entitled – ‘Status of coastal dolphins in Yanyuwa Sea Country based on a collaboration between Indigenous Sea Rangers and Western Science’.

The Northern Territory government, the Sea Rangers and the Traditional Owners will be given copies of this report. A PowerPoint presentation and posters have been prepared for the Sea Rangers. The Sea Rangers have copy of the *i*-tracker sequence developed for this project.